Release notes for ENDF/B Development g-090_Th_232 evaluation

December 2, 2016

- **checkr** Warnings:

1. A previous error halted parsing of the current section
   MAT=9040, MF= 1, MT=451 (1): Parsing stopped

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 1, MT=451
       SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      38 TO      50
   ```

2. Although the ENDF manual says MT=18/MF=4 is allowed only for the neutron sublibrary, this is too restrictive as all fission events lead to emitted neutrons
   MAT=9040, MF= 4, MT= 5 (0): Ang. dist. OK

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 4, MT=  5
       FILE  4 ALLOWED ONLY IN A NEUTRON DATA SUBLIBRARYRECORD NUMBER     131
   ```

3. A previous error halted parsing of the current section
   MAT=9040, MF= 4, MT= 5 (1): Parsing stopped

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 4, MT=  5
       SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER     131 TO     133
   ```

4. Although the ENDF manual says MT=18/MF=4 is allowed only for the neutron sublibrary, this is too restrictive as all fission events lead to emitted neutrons
   MAT=9040, MF= 4, MT= 16 (0): Ang. dist. OK

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 4, MT= 16
       FILE  4 ALLOWED ONLY IN A NEUTRON DATA SUBLIBRARYRECORD NUMBER     134
   ```

5. A previous error halted parsing of the current section
   MAT=9040, MF= 4, MT= 16 (1): Parsing stopped

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 4, MT= 16
       SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER     134 TO     136
   ```

6. Although the ENDF manual says MT=18/MF=4 is allowed only for the neutron sublibrary, this is too restrictive as all fission events lead to emitted neutrons
   MAT=9040, MF= 4, MT= 18 (0): Ang. dist. OK

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 4, MT= 18
       FILE  4 ALLOWED ONLY IN A NEUTRON DATA SUBLIBRARYRECORD NUMBER     137
   ```

7. A previous error halted parsing of the current section
   MAT=9040, MF= 4, MT= 18 (1): Parsing stopped

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 4, MT= 18
       SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER     137 TO     139
   ```

8. Although the ENDF manual says MT=18/MF=5 (PFNS) and MT=455 (nubar) are allowed only for the neutron sublibrary, this is too restrictive as all fission events lead to emitted neutrons.
   MAT=9040, MF= 5, MT= 5 (0): PFNS, nubar OK

   ```
   ERROR(S) FOUND IN MAT=9040, MF= 5, MT=  5
       FILE  5 NOT ALLOWED FOR NSUB =     0            RECORD NUMBER     141
   ```

9. A previous error halted parsing of the current section
MAT=9040, MF= 5, MT= 5 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=9040, MF= 5, MT=  5
    SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      141 TO      150
```

10. Although the ENDF manual says MT=18/MF=5 (PFNS) and MT=455 (nubar) are allowed only for the neutron sublibrary, this is too restrictive as all fission events lead to emitted neutrons.
MAT=9040, MF= 5, MT= 16 (0): PFNS, nubar OK

```
ERROR(S) FOUND IN MAT=9040, MF= 5, MT= 16
    FILE  5 NOT ALLOWED FOR NSUB =     0            RECORD NUMBER      151
```

11. A previous error halted parsing of the current section
MAT=9040, MF= 5, MT= 16 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=9040, MF= 5, MT= 16
    SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      151 TO      166
```

12. Although the ENDF manual says MT=18/MF=5 (PFNS) and MT=455 (nubar) are allowed only for the neutron sublibrary, this is too restrictive as all fission events lead to emitted neutrons.
MAT=9040, MF= 5, MT= 18 (0): PFNS, nubar OK

```
ERROR(S) FOUND IN MAT=9040, MF= 5, MT= 18
    FILE  5 NOT ALLOWED FOR NSUB =     0            RECORD NUMBER      167
```

13. A previous error halted parsing of the current section
MAT=9040, MF= 5, MT= 18 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=9040, MF= 5, MT= 18
    SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      167 TO      174
```

- `checkr` Errors:

    1. A variable is outside the allowed ENDF range
    MAT=9040, MF= 1, MT=451 (0): Variable range

    ```
    ERROR(S) FOUND IN MAT=9040, MF= 1, MT=451
        MOD =    2 OUT OF RANGE    0 -    1            RECORD NUMBER       38
    ```

    2. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=9040, MF= 1, MT=456 (0): Directory (b)

    ```
    ERROR(S) FOUND IN MAT=9040, MF= 1, MT=456
        SECTION  1/456 NOT IN DIRECTORY                RECORD NUMBER       51
    ```

    3. Missing a section/file
    MAT=9040, MF= 1, MT=456 (1): Missing data (a)

    ```
    ERROR(S) FOUND IN MAT=9040, MF= 1, MT=456
        THIS SECTION REQUIRES THE PRESENCE OF SECTION  1/RECORD NUMBER       51
    ```

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4. Missing nubar_total or LFI flag is set wrong
MAT=9040, MF= 1, MT=456 (2): No nubar_tot

```
    ERROR(S) FOUND IN MAT=9040, MF= 1, MT=456
       LFI INCORRECT OR NUBAR-TOTAL MISSING   PRECEDING RECORD NUMBER      57
```

5. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=9040, MF= 3, MT= 3 (0): Directory (b)

```
    ERROR(S) FOUND IN MAT=9040, MF= 3, MT=  3
       SECTION  3/  3 NOT IN DIRECTORY                 RECORD NUMBER      57
```

6. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=9040, MF= 3, MT= 5 (0): Directory (b)

```
    ERROR(S) FOUND IN MAT=9040, MF= 3, MT=  5
       SECTION  3/  5 NOT IN DIRECTORY                 RECORD NUMBER      84
```

7. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=9040, MF= 3, MT= 16 (0): Directory (b)

```
    ERROR(S) FOUND IN MAT=9040, MF= 3, MT= 16
       SECTION  3/ 16 NOT IN DIRECTORY                 RECORD NUMBER     100
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=9040, MF= 3, MT= 18 (0): Directory (b)

```
    ERROR(S) FOUND IN MAT=9040, MF= 3, MT= 18
       SECTION  3/ 18 NOT IN DIRECTORY                 RECORD NUMBER     111
```

- `fizcon` Errors:

  1. Missing files (probably nubar)
  MAT=9040, MF= 1, MT=456 (1): Missing files (b)

  ```
      ERROR(S) FOUND IN MAT=9040, MF= 1, MT=456
         THIS SECTION REQUIRES THAT MISSING FILE  1, MT= 452  BE PRESENT
  ```

  2. Missing files (probably nubar)
  MAT=9040, MF= 1, MT=456 (2): Missing files (d)

  ```
      ERROR(S) FOUND IN MAT=9040, MF= 1, MT=456
         BOTH SECTIONS MF=1, MT=455 AND MT=456 MUST BE PRESENT
  ```

  3. Missing files (probably spectra for outgoing particles)
  MAT -1 MF 6 (1): Missing files (a)

  ```
      ERROR(S) - MISSING SECTIONS IN MAT   -1 MF  6
         PRESENCE OF FILE 3, MT=   5 REQUIRES AN EQUIVALENT SECTION IN FILE 6
         PRESENCE OF FILE 3, MT=  16 REQUIRES AN EQUIVALENT SECTION IN FILE 6
         PRESENCE OF FILE 3, MT=  18 REQUIRES AN EQUIVALENT SECTION IN FILE 6
  ```

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- `fudge-4.0` Warnings:

  1. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: nonelastic (Error # 0): CS Sum.

     `WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 81.17%`

- `fudge-4.0` Errors:

  1. Calculated and tabulated Q values disagree.
     reaction label 0: n[multiplicity:'2'] + Th230 (Error # 0): Q mismatch

     `WARNING: Calculated and tabulated Q-values disagree: -16009082.99014282 eV vs -1.1451e7 eV!`

  2. Calculated and tabulated thresholds don't agree
     reaction label 1: n[multiplicity:'energyDependent', emissionMode:'prompt'] [total fission] / Cross section: (Error # 0): Threshold mismatch

     `WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.8e6 eV!`

  3. Calculated and tabulated Q values disagree.
     reaction label 2: sumOfRemainingOutputChannels (Error # 0): Q mismatch

     `WARNING: Calculated and tabulated Q-values disagree: 215198051066.1526 eV vs -6.364e6 eV!`